



U.S. ARMY CHEMICAL MATERIALS AGENCY

Phosgene carbonyl chloride

Military designations: CG

Description: Phosgene, a highly reactive, chlorinated chemical compound, is a colorless gas with the odor of newly mown hay. It is a highly volatile chemical that primarily poses a vapor hazard to the eyes, throat and respiratory tract, particularly at temperatures above its boiling point of 46 F. Phosgene vapor is approximately 3.4 times heavier than air.

Non-military uses: Phosgene is used widely within industry for the synthesis of isocyanates, insecticides, resins and analine dyes. More than 450,000 tons of phosgene are manufactured, transported and stored within the United States each year. Tank-car quantities of phosgene are moved on our interstate highways and railroads every day. Phosgene is also encountered during the combustion or chemical degradation of certain materials such as foamed plastics, polyvinylchloride, paint strippers (methylene chloride) and other degreasing solvents.

Military use: Phosgene was first introduced to the chemical agent battlefield by the Germans in Belgium on December 19, 1915. Because of its tendency to dissipate rapidly, phosgene was only effective when employed in large numbers of munitions with very high field concentrations. Phosgene was previously used as a weapon in projectiles, mortars and bombs and was dispersed as a vapor or aerosol droplets that vaporized rapidly.

Health effects: Exposure to phosgene vapor may cause immediate, mild irritation of the eyes, nose, throat and respiratory tract. When the mild irritant effects have subsided, a symptom-free interval may occur, during which time the individual feels fine. However, within several hours after exposure to high concentrations of phosgene, the air sacs in the lungs begin to fill with fluid and the exposed individual starts complaining of chest tightness, coughing and increased shortness of breath. The individual may develop frothy secretions at the mouth with dramatic drops in blood pressure and "dry land drowning" in the lungs. Human exposure data suggest that acute lung damage from phosgene exposure could result in the development of chronic bronchitis, asthma and emphysema, particularly if recovery is complicated by respiratory tract infections. However, no animal or human epidemiologic data exists to suggest that chronic phosgene exposure causes cancer in those exposed or in the occurrence of adverse developmental effects in the unborn fetus.

Environmental fate: Phosgene is not persistent in surface water, groundwater or soil that contains moisture because of its rapid breakdown into carbon dioxide and hydrochloric acid. Phosgene is not persistent in dry soil because of its tendency to evaporate readily.

For more information,
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